day 14

Oct 5 SAT

MHS has been added as a testing site.

If you would like to CHANGE see guidance.

only MHS students are allowed to change for free

Sep 16-6:02 PM

Paper:

Name

Colleges you are considering

If you are one of the folks that NEEDS the online book printed, let me know that too.

Sep 17-7:43 AM

2.6

21) $p(x) = 4x^5 - 3x^2 + 1$

00 there are no discontinuities.

So, lets consider the 3 parts of the checklist for $x = a$.

i) is $p(x)$ defined at $x = a$? yes

ii) does $\lim_{x \to a} p(x)$ Exist? yes $\lim_{x \to a} p(x) = p(a)$

iii) $\lim_{x \to a} p(x) = p(a)$. Yes. therefore continuous on $\mathbb{R}$

2.6

21

39

41

22

26

27

39) $f(x) = \begin{cases} x^2+3x & \text{if } x \geq 1 \\ 2x & \text{if } x < 1 \end{cases}$

x^2+3x is continuous on its domain

$2x$ " " " " "

possible discontinuity: $x=1$

i) does $f(x)$ exist at $x=1$?

Yes! $f(1) = (1)^2+3(1) = 4$

ii) does $\lim_{x\to 1} f(x)$ exist?

$\lim_{x\to 1^+} f(x) = \lim_{x\to 1^+} x^2+3x = 4$

$\lim_{x\to 1^-} f(x) = \lim_{x\to 1^-} 2x = 2$

$4 \neq 2$ so $\lim_{x\to 1}$ DNE.

Not continuous at $x=1$.

$f(x)$ is continuous on $(-\infty, 1) \cup (1, \infty)$

By an argument similar to 21, continuous everywhere else

2.6

21

39

41

22

26

27

Note AP-talk

the ideas of right-continuous and left-continuous will not be tested.

Also: 1969 AP multiple choice

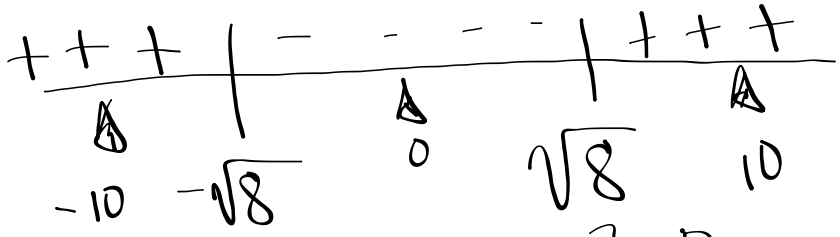
find questions you can do (weekend)

2.6
21
39
41
22
26
27

41) $f(x) = \sqrt{2x^2-16}$ domain: $2x^2-16 \geq 0$

$2x^2-16 = 2(x-\sqrt{8})(x+\sqrt{8})$

Sign chart of $2x^2-16$



domain: $(-\infty, -\sqrt{8}] \cup [\sqrt{8}, \infty)$

26
21
39
41
22
26
27

SET a collection of objects.

$\{1\}$

$(-1, 10)$

$[0, 1]$

$\{\} = \emptyset$ null set

$\cup$ union - a join

$\cap$ intersection - in both

$\in$ element of (member of)

LOGIC

statements that can be answered true or false.

Valid statements combined correctly

$\wedge$ and $\neg$ NOT

$\vee$ or

IF .. THEN ....

$f(x)$ is continous on $(0, \infty)$ $\wedge$ $f(x) > 0$ $\forall x \in \mathbb{R}$

22 $g(x) = \dfrac{3x^2 - 6x + 7}{x^2 + x + 1}$ domain: good question

$x^2 + x + 1 = 0 \iff x = \dfrac{-1 \pm \sqrt{1 - 4(1)(1)}}{2}$

not a real #

domain is $\mathbb{R}$.

continuous on $\mathbb{R}$ [[argument like 21]]

26

21

39

41

22

26

27

14) $f(x) = \dfrac{2x^2+3x+1}{x^2+5x}$ $a = -5$

$f(x) = \dfrac{(2x+1)(x+1)}{x(x+5)}$

factor x^2+3x+2

$(x+2)(x+1)$

continuous?

i) $f(x)$ defined at $x=-5$?

NO

therefore not continuous

26

21

39

41

22

26

27

HW: 2.6/ 57, 59-60, 65-67

3.1/ 1-10

Try your best

2.6

21

39

41

22

26

27

2.6/27

$$\lim_{x\to 0}\left(x^8-3x^6-1\right)^{40}$$

$$= \left(\lim_{x\to 0}\left(x^8-3x^6-1\right)\right)^{40} = (-1)^{40} = 1$$

Sep 17-7:56 AM